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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/929,985	08/14/2001	James K. Mainquist	P0013US10	3858

29490 7590 11/05/2004

GENOMICS INSTITUTE OF THE
NOVARTIS RESEARCH FOUNDATION
10675 JOHN JAY HOPKINS DRIVE, SUITE E225
SAN DIEGO, CA 92121-1127

EXAMINER	
SODERQUIST, ARLEN	

ART UNIT	PAPER NUMBER
1743	

DATE MAILED: 11/05/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/929,985	MAINQUIST ET AL.	
	Examiner	Art Unit	
	Arlen Soderquist	1743	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 September 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-15,17-24,27-35 and 37-42* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-15,17-24,27-35 and 37-42* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

1. Claims 29-34 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In claim 29 "the support' does not have antecedent basis. Additionally, it is not clear what constitutes an additional component for performing high-throughput assays: the additional structure of claims 30-31, a support surface, a reagent for use in the assay or something else. As such it is not clear if the structure of claims 30-31 constitute the additional component of claim 29 or are additional structure of the system. For examination purposes, claim 29 will be treated as any additional structure will constitute the additional component: a support surface, a reagent or the structural elements of claims 30-31. claims 32-34 also have the additional component problems of claims 29-31.

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

3. Claims 1-9, 12 and 29-30 are rejected under 35 U.S.C. 102(b) as being anticipated by Norris (US 5,592,289). In the patent Norris teaches a self-aligning mechanism for positioning analyte receptacles comprises a loading carriage which bears a tray. In its preferred embodiment, the positioning mechanism of Norris has a loading carriage (200), which carries the tray (244). The loading carriage is slidingly mounted in a structure and includes two guide pins (222,224) situated along the front of the loading carriage, one guide pin (226) located along the

side of the loading carriage, and one stop pin (238) positioned at the rear thereof. In the paragraph bridging columns 2-3 Norris teaches that they desire to provide a positioning mechanism for specimens to be assayed by a measuring instrument where the positioning mechanism allows insertion of a receptacle containing the analyte samples to be assayed by conventional and inexpensive robotic mechanisms, and provides accurate alignment of the analyte receptacle, e.g., a microplate or a silicon wafer, with respect to the measuring instrument performing the assays (see also column 6, lines 33-39). The device also has a biasing devices or pushers such as a leaf spring (268), helical spring (280), actuators or magnets (paragraph bridging columns 6-7 and column 8 lines 24-54).

4. Claims 1-2, 12-15 and 17-18 are rejected under 35 U.S.C. 102(e) as being anticipated by Bevirt (US 6,063,579). In the patent Bevirt teaches an alignment mechanism to precisely position a work surface to facilitate the transfer of materials in an automated manner. In column 1, Bevirt teaches that a microtiter plate or other piece of laboratory equipment that is subject to multiple rounds of heating and cooling during a series of manipulations may become nonuniform in the flatness of its working surface causing the depth of individual wells to vary and resulting in problems with automated material transfer from the plate. The invention overcomes the described problem during material transfer processes by providing a method for flattening or elongating the work surface in order to precisely align the work surface in relationship with a dispenser. In figures 4-5 the functioning of the device is taught. As illustrated in figure 4, a plate, such as a 384-well microtiter plate (50), is placed on a mold (52). The figure shows the positioning of the microtiter plate prior to applying pressure. The microtiter plate is shown elevated from the bottom surface (54) of the mold and supported by the top portion (56) of an elastomeric seal (58). An internal structure (60) is used to correctly position the microtiter plate with respect to the structure prior and during the application of a vacuum. The figure also shows a vacuum channel (62) leading from a vacuum port to individual vacuum outlets. Figure 5 illustrates how the plate is deformed to flatten the work surface of the assay plate once pressure is applied. The microtiter plate (70) has a plurality of wells (72), each having a well bottom (74), which may contact the bottom surface (76) of the mold. An internal structure (78) keeps the microtiter plate centrally positioned with respect to the rest of the mold and any material dispenser positioned above the mold structure. Once pressure is applied, the elastomeric seal

(80) is sufficiently flexible to allow for vertical or horizontal motion of the outer rim (82) of the plate when the plate is compressed against the substantially planar upper surface (84) of the mold. The position of the center region (86) is maintained by the internal structure. Typically, as a consequence of the movement of the plate, the shape of the elastomeric seal has changed.

5. Claims 1-12, 21-23, 29, 39-40 and 42 are rejected under 35 U.S.C. 102(b) as being anticipated by Burton (WO 99/04228) or Modlin (US 6,071,748). The published application and the Modlin patent have equivalent disclosures that anticipate the above claims. Since both have equivalent disclosures the patent will be described. The anticipatory disclosure in the published application is shown in figures 40-43 and described on pages 46-51. In the patent Modlin describes a high-throughput light detection instrument. Figure 24 shows a general structure in which the light detection instrument is a part. Column 2 lines 56-62 discusses what is typical in current automated high-throughput analyzers including assay analyzers, liquid handling systems, robotics, computers for data management, reagents and assay kits, and microplates for automation of sample dispensing to data collection. In figures 22(a-c) and 23 Modlin teaches a transporter assembly used in the light detection device of the patent. Figures 22a-b show a stage for supporting a composition for analysis by the analyzer in the form of a transporter (600). The transporter includes a transporter body (602) and substantially parallel first and second transporter flanges (604a,b) that extend outward from the transporter body. First and second transporter flanges terminate in first and second transporter extensions (606a,b) that turn in toward one another without contacting one another. The transporter body, flanges, and extensions lie substantially in a plane and define a transporter cavity (608) that is larger than any sample containers that the transporter is intended to support. The shape of this cavity, rectangular, is chosen to accommodate the shape of the preferred sample containers, such as microplates. In the analyzer, long sides of the rectangular sample container are positioned against the flanges. Transporter shelves (610) along portions of the body, the flanges, and the extensions form a structure that supports the bottom of the sample container. Other support mechanisms, such as **pins or pegs**, also could be employed instead of or in addition to shelves. The transporter also includes an automatic sample container positioning mechanism (620) for precisely and reproducibly positioning sample containers within the cavity along Y and X axes with positioning arms (622a,b) that contact the sample container to control its Y and X position,

respectively. The Y-axis positioning arm (622a) lies substantially within a channel (624) in the body and includes a rod (626a) having the bent shape shown. A first end (628a) of the rod terminates near the cavity with a bumper tab (630a,632) for engaging a sample container. A second end (634a) of the rod terminates away from the cavity in an actuator tab (636a) for controlling movement of the arm. An Y-axis biasing spring (642a) is present. X-axis positioning arm (622b) also lies substantially within the channel (624) in the body and is similar to the Y-axis positioning arm, except that the first end segment (628b) terminates in a lever tab (630b) in the X-axis positioning arm rather than a bumper. The X-axis positioning arm is connected via the lever tab to an X-axis positioning lever (654) that lies along the transporter flange (604b). The X-axis positioning lever includes two functional lever projections (656,658) and is pivotally mounted about a lever pivot axis (659) on the transporter near the intersection of the body and the flange (604b). A first lever projection (656) is substantially perpendicular to the flange (604b) and abuts the lever tab on the X-axis positioning arm for actuating the positioning lever. A second lever projection (658) also is substantially perpendicular to the flange (604b) and includes an edge (660) for contacting a sample container. In use the transporter occupies a loading position substantially outside a housing for a person, robot, or mechanical stacker to place a sample container into the cavity so that the bottom of the sample container rests on the transporter shelves. Under the action of both positioning arms, the sample container is precisely and reproducibly positioned (registered) against a reference comer (672) within the cavity. The biasing springs (642a,b) can be chosen to have different strengths, so that the X-Y positioning action is performed less or more forcefully. As long as the microplate is placed in any position on the lower guide shelves, it can be adjusted into place by the automatic microplate positioning mechanism. A sensor (not shown) detects the presence of the sample container. The transporter can also eject the sample containers. Figure 23 shows a perspective view of the transporter mounted on base platform (700) with drive mechanisms for moving the transporter between loading and examination positions. The drive mechanism is provided multiple mechanisms for moving the transporter.

6. Claims 1, 3-5, 12, 29 and 31 are rejected under 35 U.S.C. 102(b) as being anticipated by Lancaster (US 3,568,735). In the patent Lancaster teaches a laboratory microtitration dispensing apparatus. Relative to the instant claims applicant is directed to figures 9-10 and their associated

discussion. In the device a carrier plate (40) may support a plurality of separate vials or tubes or may suitably support a transparent microtitration plate (140) having a plurality of wells (142). When the latter is used, the carrier is provided with a titration plate locator and guide assembly as shown in figure 10 including a rectangular plate (144) fixed to the carrier by rivets (146), the upper projecting ends of which serve as locator pins received within the cutout corners (148) of an hollowed locator (150) on which the titration plate rests as shown in figures 5 and 6. The sides of the titration plate overlap the sides of locator with the base of the wells resting on the bottom of locator. This locator assembly enables an operator to readily replace one titration plate for another and ensures that the wells of the titration plate will be accurately aligned with their respective corresponding needles (128) during a dispensing operation.

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

8. Claims 13-15, 17-20, 24, 27-28, 30-35, 37-38 and 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Burton or Modlin as applied to claims 1-12, 21-23, 29, 39-40 and 42 above, and further in view of Cathcart (US 5,443,791), Markin (US 5,417,922) and Bevirt as explained above. The Burton application and Modlin patent do not teach specifics regarding the structure for liquid handling systems, robotics and reagent, assay kit and microplate storage.

In the patent Cathcart teaches an automated Molecular biology laboratory. In the device a liquid-handling instrument has a worksurface with registration for modular stations to support

containers of liquid, pipette apparatus with a pipette tip coupled to a sensing circuit, a robotic translation system for moving the pipette tip, and a control system with an iconic user interface for programming and editing. A gauge block registered on the worksurface provides for calibration using the sensing tip, and register cavities on the worksurface provide for modular stations. There is a wash station fop the pipette tip on the worksurface. An automated laboratory based on the liquid-handling system has heating and cooling and a sealable incubation station as well as a magnetic separation station. Methods are disclosed using the apparatus to convey droplets of liquid, to aspirate with minimum tip contamination, to mix liquids in containers, and to validate the worksurface. Procedures in chemistry, particularly in biochemistry, present generally more difficult problems for automation than many other kinds of processes and procedures. One reason is that there is often a very long sequence of steps in a biochemical procedure, such as gene detection and sequencing DNA. Another is that an automatic system needs to be very versatile, because different kinds of starting materials and different analytical purposes require different steps, different order of steps and the use of different kinds of chemical reagents. A third is that sample quantity is, for various reasons, quite limited, and only very small volumes, often on the order of microliters, must be used. What is needed is automatic robotic apparatus for doing liquid transfers with very small quantities of liquids, and in a manner that avoids carryover and evaporation. Such an instrument needs to be modular in nature so that container stations may be interchanged, with modular stations for holding containers so that such operations as sample preparation and cleaning may be done off-line. Methods for operation of such apparatus are needed allowing a relatively large number of samples to be processed at a time, with samples and reagents placed in a close array to preserve space. The robotic actions need to be rapid to minimize overall processing time and extremely accurate to be able to access many small sites. Such an apparatus needs to be integrated with a control system that allows an operator to easily and quickly set up procedures with different variables, different step sequences, and different samples and reagents. Also needed is laboratory apparatus based on such a liquid handling system to incorporate further techniques, such as temperature control and a separation station, to be able to fully automate specific chemistry protocols such as for gene detection and DNA sample purification. The general form of the apparatus is shown in figure 1 and for performing DNA sequencing the automated laboratory has a closeable, heated, clamped-

lid thermal cycling station (21), an actively cooled enzyme storage station (23), a wash station (25), a reagent storage position (27) for storing and presenting frequently used reagents, a DNA sample stage (28), a wash buffer storage (30), and two magnetic particle wash stations (26,29) for manipulating paramagnetic particles in suspension in liquid mixtures. Also shown is a gauge block (24) for use in calibrating the robotic drives for the apparatus. The various stations are arranged on a worksurface (22). In the preferred embodiment the stations on the worksurface are registered in cavities machined into the worksurface maintaining close tolerance dimensions from cavity to cavity and to the position of the gauge block, so modular stations may be interchanged while maintaining information about the position of containers relative to the worksurface and the gaugeblock.

In the patent Markin teaches a specimen carrier for transporting conventional specimen tubes throughout an automatic laboratory conveyance system includes a generally rectilinear carrier body with a forward face having an identification zone delimited thereon. An identification code is marked in the identification zone so as to permit mechanical sensing and identification of the carrier on a conveyor system. A plurality of holes of various diameters and depths are provided in the top surface of the carrier to receive conventional specimen tubes of various types with the top ends of the specimen tubes located at a predetermined height above the top surface of the carrier. A specimen carrier (10) may be temporarily stored on storage racks (70), as shown in figure 6. Each storage rack includes a base plate (72) with a plurality of locator pins (74) projecting upwardly from the upper surface of the base plate. Locator pins are arranged in sets of pairs that are longitudinally spaced apart so as to correspond with a pair of apertures (62,64, see figure 3) on each specimen carrier. Pin pairs are spaced apart laterally a distance such that specimen carriers are laterally spaced apart to permit the specimen carrier to be grasped by the jaws (76) of a robot arm (78).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the various components of Cathcart, Markin and Bevirt into the Burton or Modlin analyzers because of the ability to carry out complex procedures such as the high-throughput procedures of Burton or Modlin in a minimal amount of time as taught by Cathcart.

9. Applicant's arguments filed September 9, 2004 have been fully considered but they are not persuasive. Relative to claims 29 and 32, the objections have been overcome, but the

changes introduced new issues regarding the clarity of the claims and those which depend therefrom. Relative to the "contact an inner wall" language in the claims examiner points out that the same structure can be used to contact an inner wall or an outer wall depending on the placement of the microtiter plate and the presence of an inner wall in the microtiter plate. Since the claims are not directed to a microtiter plate in combination wit the positioning device, the position that the alignment member(s) of the references would contact a microtiter plate do not carry patentable weight unless they are not capable of contacting an inner wall of a microtiter plate. Even when the combination is claimed, it is only when the claim requires the microtiter plate to be positioned with the alignment member(s) in contact with an inner wall of the microtiter plate that the teachings of the reference do not anticipate the claims in this respect. If the contract is not required b y the claims then the capability to provide the contact is all that is required and as long as the structure is capable of providing the contact, the reference does not need to teach the contact to anticipate the claimed structure. Another way of looking at it is if the claim does not require the alignment member(s) and microtiter plate to be in contact, the reference does not need to teach it to anticipate the claimed structure. This is relevant to all of the anticipatory references. Relative to the Bevirt reference and language of claim 14 examiner points out that the language does not require either a microtiter plate as a part of the structure or further limit the structure require the perimeter surface of a microtiter plate in contact with the lip surface. Thus the argument is not commensurate in scope with the claim. Relative to the Lancaster reference, the microtiter plate is not required for the rejected claims and the above comments are appropriate.

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

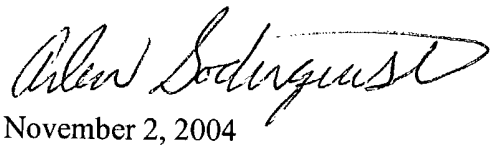
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Arlen Soderquist whose current telephone number is (571) 272-1265 as a result of the examiner moving to the new USPTO location. The examiner's schedule is variable between the hours of about 5:30 AM to about 5:00 PM on Monday through Thursday and alternate Fridays.

A general phone number for the organization to which this application is assigned is (571) 272-1700. The fax phone number to file official papers for this application or proceeding is (703) 872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



November 2, 2004

ARLEN SODERQUIST
PRIMARY EXAMINER